

Application No.: 09/870226

Case No.: 54538US012

REMARKS

Claims 1-21 and 35-37 are pending. Claims 1, 4, 15, and 35 have been amended. Claim 2 has been cancelled and its substance was incorporated into amended claim 1. Support for the amendments to claims 15 and 35 can be found, for example, in originally filed claim 11 and at page 16, lines 7-10 of the application. Applicants acknowledge, with thanks, the Examiner's indication that claim 14 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Common Ownership Issue

All claims in the application were commonly owned at the time any inventions covered by the application were made.

§ 103 Rejections

Claims 1-13 and 19 stand rejected under 35 USC § 103(a) as being unpatentable over Chau et al. (U.S. Patent No. 5,735,988) in view of Stamm (U.S. Patent No. 3,712,706) as applied to claims 15-18, 20, 21 and 35-37 above and further in view of Rowland (U.S. Patent No. 3,810,804). Claims 1-13, 15-21 and 35-37 also stand rejected under 35 USC § 103(a) as being unpatentable over Rowland (U.S. Patent No. 5,376,431) or Rowland (U.S. Patent No. 3,810,804) in view of Stamm.

Similar rejections under 35 USC § 103(a) were made in the related U.S. Patent Application No. 09/870,180 (the present application and U.S. Patent Application No. 09/870,180 are, respectively, continuation and divisional patent applications filed on May 30, 2001 that claim priority of U.S. Patent Application No. 09/228,367, which issued on August 28, 2001 as U.S. Patent No. 6,280,822). The rejections made in U.S. Patent Application No. 09/870,180 were appealed under 35 USC § 134 to the Board of Patent Appeals and Interferences. In its July 27, 2005 decision, the Board of Patent Appeals and Interferences overturned the Examiner's rejection of independent claim 22 (which is similar to independent claim 1 of the present application) and affirmed the Examiner's rejection of independent claim 31 (which is similar to independent claim 15 of the present application). For the Examiner's convenience, applicants enclose a copy of the July 27, 2005 decision of the Board of Patent Appeals and Interferences.

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1. Rejection of Claims 1-13, 15-21, and 35-37 in view of Chau et al. in view of Stamm in view of Rowland

In the August 22, 2005 Office action relating to the present application, the Examiner states that "Chau et al. disclose a method for making a reflective (i.e. engineered reflective surface), article" (page 2) and "applying the radiation curable adhesive" (page 3). The Examiner admits that "Chau et al. are silent as to the structured surface comprising retroreflective cube corner cavities" (page 3). However, the Examiner relies on Stamm for disclosure of retroreflective articles. Specifically, the Examiner states that "Stamm discloses a surface topography to produce retroreflective articles" (page 3). The Examiner then finds that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to Chau et al. to use the cube corner cavity surface topography, as taught by Stamm" (page 3).

The Examiner admits that "Chau et al. and Stamm . . . teach all of the limitations in claims 1 and 19 except for specifically reciting the radiation curable adhesive is pressure-sensitive" (Page 4). However, the Examiner relies on Rowland (U.S. Patent No. 3,810,804) for disclosure that the acrylic based radiation-curable adhesives taught in Chau et al. are pressure-sensitive (page 4). Specifically, the Examiner states that Rowland describes an "acrylic pressure-sensitive adhesive [that is applied] to the structured surface" (page 4).

With regard to amended claim 1 and its dependent claims, applicants assert that none of Chau et al., Stamm, or Rowland, alone or in combination, describe a "transparent, pressure-sensitive adhesive layer that fills the cube corner cavities," as recited in amended claim 1 and its dependent claims. Applicants direct the Examiner's attention to the July 27, 2005 decision of the Board of Patent Appeals and Interferences, which states that "Chau and Stamm are silent as to employing the claimed transparent radiation curable pressure-sensitive adhesive. To remedy this deficiency, the examiner relies on the disclosure of Rowland. It appears to be the examiner's position that the UV curable transparent acrylic resin taught by Chau necessarily or inherently has pressure-sensitive adhesive properties as evidenced by Rowland. . . . [N]othing in Rowland referred to by the examiner teaches that the UV curable resin taught by Chau has pressure-sensitive adhesive properties or that its pressure-sensitive adhesive is radiation or UV curable" (page 8).

With regard to amended claims 15 and 35 and their dependent claims, applicants

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assert, as is described in greater detail below, that none of Chau et al., Stamm, or Rowland, alone or in combination, describe (1) a radiation-curable composition layer with an elastic modulus that is less than about 690 MPa or (2) a body layer having an elastic modulus that is greater than about 690 MPa, as recited in amended claims 15 and 35 and their dependents.

2. Rejection of Claims 1-13, 15-21 and 35-37 in view of Rowland ('431) or Rowland ('804) in view of Stamm

In the August 22, 2005 Office action relating to the present application, the Examiner states that "[b]oth primary references teach a retroreflective article comprising cube corner prisms coated with a reflective layer that has an adhesive there over" (page 5). "The primary references differ from the recited invention in that the prisms are considered a positive array instead of a negative array" (page 5). However, the Examiner relies on Stamm for disclosure that "an array of cube corner elements can be in either cavity or prism form, then coated [with] reflective material and filled in with a transparent medium in order to form an optical element having high reflective efficiency" (page 6). Thus the Examiner states that "it would have been obvious to one having ordinary skill in the art at the time the invention was made . . . to form the cube corner elements as a cavity" (page 6).

With regard to independent claim 1 and its dependent claims, applicants assert that none of Rowland ('431), Rowland ('804), or Stamm describe a "transparent, pressure-sensitive adhesive layer that fills the cube corner cavities," as recited in amended claim 1 and its dependent claims. Applicants again direct the Examiner's attention to the above-cited passages of the July 27, 2005 decision of the Board of Patent Appeals and Interferences.

With regard to amended claims 15 and 35 and their dependents, applicants assert that none of Rowland ('431), Rowland ('804), or Stamm describe, alone or in combination, (1) a radiation-curable composition layer with an elastic modulus that is less than about 690 MPa and (2) a body layer having an elastic modulus that is greater than about 690 MPa, as recited in amended claims 15 and 35 and their dependents. The Examiner appears to agree with applicants' assertion that none of the cited references teach the recited claim elements, but the Examiner states that "[t]he elastic modulus of claims 10 and 11 would be obvious to one of ordinary skill in the art motivated by the fact that the structure has been shown to be known and similar materials

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are used in the prior art and one would conform properties of an article to its particular application" (page 6). Applicants respectfully disagree with the Examiner's statement.

Stamm does not describe a body layer having an elastic modulus that is greater than 690 MPa. Instead, Stamm teaches the use of the following materials: "a continuous sheet or plate of plastic material such as polymethylmethacrylate, polycarbonate, cellulose acetate, polystyrene, ABS resin, silicones, polyvinyl resins, and the like" (col. 24, lines 43-46). Stamm further teaches the use of "a thin foil of metal such as aluminum or stainless steel or tin alloyed with antimony that is sufficiently workable so that it can be drawn so as to conform to the precision pattern by embossing" (col. 5, lines 53-56). Lastly, Stamm describes "plastic 'globs,' plastic sheet, or metal foils" (col. 5, lines 64-66). Many of the materials described in Stamm, specifically silicones and polyvinyl resins, have an elastic modulus that is less than 690 MPa. Further, Stamm does not describe a radiation curable composition layer, as recited in amended claims 15 and 35. As the Board of Patent Appeals and Interferences states, "Stamm [is] silent as to employing the claimed transparent radiation curable pressure-sensitive adhesive" (page 8).

In view of the above, it is submitted that the application is in condition for allowance. Reconsideration of the application is requested.

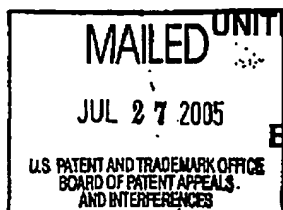
Respectfully submitted,

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The opinion in support of the decision being entered today was not written
for publication and is not binding precedent of the Board.



UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KENNETH L. SMITH, GERALD M. BENSON, MICHELE A. CRATON,
MICHAEL P. DANIELS and ROGER E. LUEHRS

Appeal No. 2005-1595
Application No. 09/870,180

ON BRIEF

Before KIMLIN, PAK, and WALTZ, Administrative Patent Judges.
PAK, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the examiner's final
rejection of claims 22 through 36 which are all of the claims pending in the above-
identified application.

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APPEALED SUBJECT MATTER

The subject matter on appeal is directed to a method of making cube corner articles, such as retroreflective articles having cube corner cavities. See the claims on appeal, together with the specification, page 1. Details of the appealed subject matter are recited in representative claims 22¹ and 31 reproduced below:

22. A method of making a cube corner article, comprising:

providing a body layer having a structured surface that includes recessed faces defining

cube corner cavities;

applying a film of reflective material at least to the recessed faces;

applying to the structured surface a flowable composition suitable for forming a

transparent pressure-sensitive adhesive; and

exposing the composition to radiation sufficient to crosslink the composition after the

composition has filled the cube corner cavities.

31. A method of making a cube corner article, comprising:

providing a body layer having a structured surface that includes recessed faces defining

¹ The appellant stipulates that "[t]he appealed claims stand or fall together." See the Brief, page 2. Therefore, we select claims 22 and 31 as representative of two separate groups of the claims on appeal subject to different grounds of rejection and decide the propriety of these grounds of rejection based on the representative claims in accordance with 37 CFR § 1.192(c)(7) (2003) and 37 CFR § 41.37(c)(1)(vii)(2004). See *In re McDaniel*, 293 F.3d 1379, 1384, 63 USPQ2d 1462, 1465-66 (Fed. Cir. 2002).

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cube corner cavities;
applying a film of reflective material to the recessed faces;
applying to the structured surface a radiation-curable composition suitable for bonding to
the film of reflective material; and
exposing the composition to radiation sufficient to crosslink the composition after the
composition has filled the cube corner cavities.

According to pages 23 and 24 of the specification:

"Cube corner cavity" means a cavity bounded at least in part by three faces arranged as a cube corner element.

"Cube corner element" means a set of three faces that cooperate to retroreflect light or to otherwise direct light to a desired location.

"Cube corner element" also includes a set of three faces that itself does not retroreflect light or otherwise direct light to a desired location, but that if copied (in either a positive or negative sense) in a suitable substrate forms a set of three faces that does retroreflect light or otherwise direct light to a desired location.

....
"Retroreflective" means having the characteristic that obliquely incident incoming light is reflected in a direction antiparallel to the incident direction, or nearly so, such that an observer at or near the source of light can detect the reflected light.

PRIOR ART REFERENCE

The prior art references relied upon by the examiner are:

Stamm	3,712,706	Jan. 23, 1973
Rowland	3,810,804	May 14, 1974
Chau et al. (Chau)	5,735,988	Apr. 7, 1998

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REJECTION

The appealed claims stand rejected as follows²:

- 1) Claims 31, 33, 34 and 36 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Chau and Stamm; and
- 2) Claims 22 through 30, 32 and 35 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Chau, Stamm and Rowland.

OPINION

We have carefully reviewed the claims, specification and prior art, including all of the arguments advanced by both the examiner and the appellants in support of their respective positions. As consequence of this review, we have made the determinations which follow.

Under 35 U.S.C. § 103, the obviousness of an invention cannot be established by combining the teachings of the prior art references absent some teaching, suggestion or incentive supporting the combination. ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). This does not mean that the cited prior art references must specifically suggest making the combination. B.F. Goodrich Co. V. Aircraft Braking Systems Corp., 72 F.3d 1577, 1582, 37 USPQ2d 1314, 1318 (Fed. Cir. 1996); In re Nilssen, 851 F.2d 1401, 1403, 7 USPQ2d 1500, 1502 (Fed. Cir. 1988). Rather, the test for obviousness is what the combined teachings of the references would

² See the Answer, pages 3-5 and the Brief, page 5.

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have suggested to those of ordinary skill in the art. In re Young, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991); In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). This test requires us to take into account not only the specific teachings of the prior art references, but also any inferences which one skilled in the art would reasonably be expected to draw therefrom. In re Preda, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968).

With the above test in mind, we turn to the examiner's rejection of claims 31, 33, 34 and 36 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Chau and Stamm. We find that Stamm teaches a method of forming a high efficiency retroreflective article through improving the dimensions of cube corner cavities. See the abstract and columns 1-4. According to the appellants (Brief, page 3), the retroreflective article referred to by Stamm is "an optical reflector that utilizes cube corner cavities." The examiner finds (Answer, page 5), and the appellants do not dispute (Brief, pages 5-6), that Stamm's method for manufacturing this article generally involves providing a base layer having a structure surface defining improved "cube corner cavities separated on their top surface on the base layer", applying a film of a reflective material (mirror coat) to the cavities and "filling the structured surface with an optically transparent material." See also Stamm, column 5, lines 8-15. We note that Stamm does not specify the type of the optically transparent material employed and its curing method.

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To remedy this deficiency, the examiner relies on the disclosure of Chau. As correctly found by the examiner (Answer, page 5), Chau teaches a method of making laminated optical components having embedded optical elements, which comprises forming a resin body having a replicated surface topography, coating the surface with a reflective coating and depositing at least partially a UV curable "transmissive" index matching fluid in the coated surface. See also, Chau, column 1, lines 5-10 and column 5, line 57 to column 6, line 25. The examiner finds (Answer, page 4), and the appellants do not dispute (Brief in its entirety), that Chau teaches (column 9, lines 39-48):

A practical application of the present invention which has value within the technological arts is transferring a surface topography, such as, for example, a collimating array of micropisms, a surface diffuser, or even a diffraction grating. Further, all the disclosed embodiments of the present invention are useful in conjunction with transferring surface topography patterns such as are used for the purpose of decoration, or the like. There are virtually innumerable uses for the present invention described herein, all of which need not be detailed here.

It follows that Chau's "optical components" and resin body having "any surface topography" are inclusive of the optical reflector and the resin body having an improved topography (cube corner cavities) taught by Stamm. Indeed, the appellants acknowledge that Chau teaches that **"any type of surface topography can be used to make his reflective article...(emphasis ours)"** See the Brief, page 3. We find that Chau teaches that its "reflective article" can be enhanced upon using a reflective coating and a UV curable "transmissive" index matching fluid on a resin body having "any type of surface topography". See column 6, lines 25-41.

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Given the similarities of the methods and resulting articles described in Chau and Stamm and the advantages of using Chau's optically transmissive material and Stamm's surface topography (specifically cube corner cavities), we concur with the examiner that one of ordinary skill in the art would have been led to employ the advantageous features taught by both Stamm and Chau to arrive at the subject matter recited in claim 31.

Notwithstanding the appellants' arguments to the contrary, we determine that from the above teachings, one of ordinary skill in the art would have had a reasonable expectation of successfully obtaining an improved optical reflector, i.e., a retroreflective article, by using Chau's UV curable "transmissive" index matching fluid as an optically transparent material for Stamm's resin body having an improved topography (cube cornered cavities) coated with a reflective (mirror) material.

The appellants argue that "the combination of Chau with Stamm would negatively impact the performance of Chau and is, therefore, contrary to the teachings of Chau." See the Brief, page 5. We do not agree. As indicated supra, one of ordinary skill in the art interested in improving reflective articles in general, including the reflective articles taught by Stamm, would have been led to employ the advantageous features taught by both Chau and Stamm. This is especially true in this situation since both Stamm and Chau are directed to similar reflective article making methods of making.

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For the foregoing reasons and the reasons set forth in the Answer, we affirm the examiner's decision rejecting claims 31, 33, 34 and 36 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Chau and Stamm.

We turn next to the examiner's rejection of claims 22 through 30, 32 and 35 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Chau, Stamm and Rowland. The disclosures of Chau and Stamm are discussed above. As acknowledged by the examiner (Answer, page 5), Chau and Stamm are silent as to employing the claimed transparent radiation curable pressure-sensitive adhesive.

To remedy this deficiency, the examiner relies on the disclosure of Rowland. Id. It appears to be the examiner's position that the UV curable transparent acrylic resin taught by Chau necessarily or inherently has pressure-sensitive adhesive properties as evidenced by Rowland. See the Answer, pages 5-6. However, the columns, lines and examples of Rowland referred to by the examiner only teach or suggest applying a pressure-sensitive adhesive material to a specifically formed base layer having cube corner cavities coated with a reflective material. As argued by the appellants (Brief, page 4), nothing in Rowland referred to by the examiner teaches that the UV curable resin taught by Chau has pressure-sensitive adhesive properties or that its pressure-sensitive adhesive is radiation or UV curable. See also Rowland, column 4, lines 42-50, column 7, lines 63-70 and 74-75, column 8, lines 1-2 and the Examples.

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For the foregoing reasons and the reasons set forth in the Brief, we are constrained to agree with the appellants that the examiner has not demonstrated, by preponderance of evidence, that the UV curable resin taught by Chau inherently or necessarily has pressure-sensitive adhesive properties. Hence, on this record, we cannot sustain the examiner's decision rejecting claims 22 through 30, 32 and 35 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Chau, Stamm and Rowland.

CONCLUSION

In view of the foregoing, we affirm the examiner's decision rejecting claims 31, 33, 34 and 36 under 35 U.S.C. § 103(a), but reverse claims 22 through 30, 32 and 35 under 35 U.S.C. § 103(a).

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TIME PERIOD

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART


EDWARD C. KIMLIN
Administrative Patent Judge


CHUNG K. PAK
Administrative Patent Judge

THOMAS A. WALTZ
Administrative Patent Judge

) BOARD OF PATENT
) APPEALS
) AND
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СКР/р

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